DATAMATION® 84

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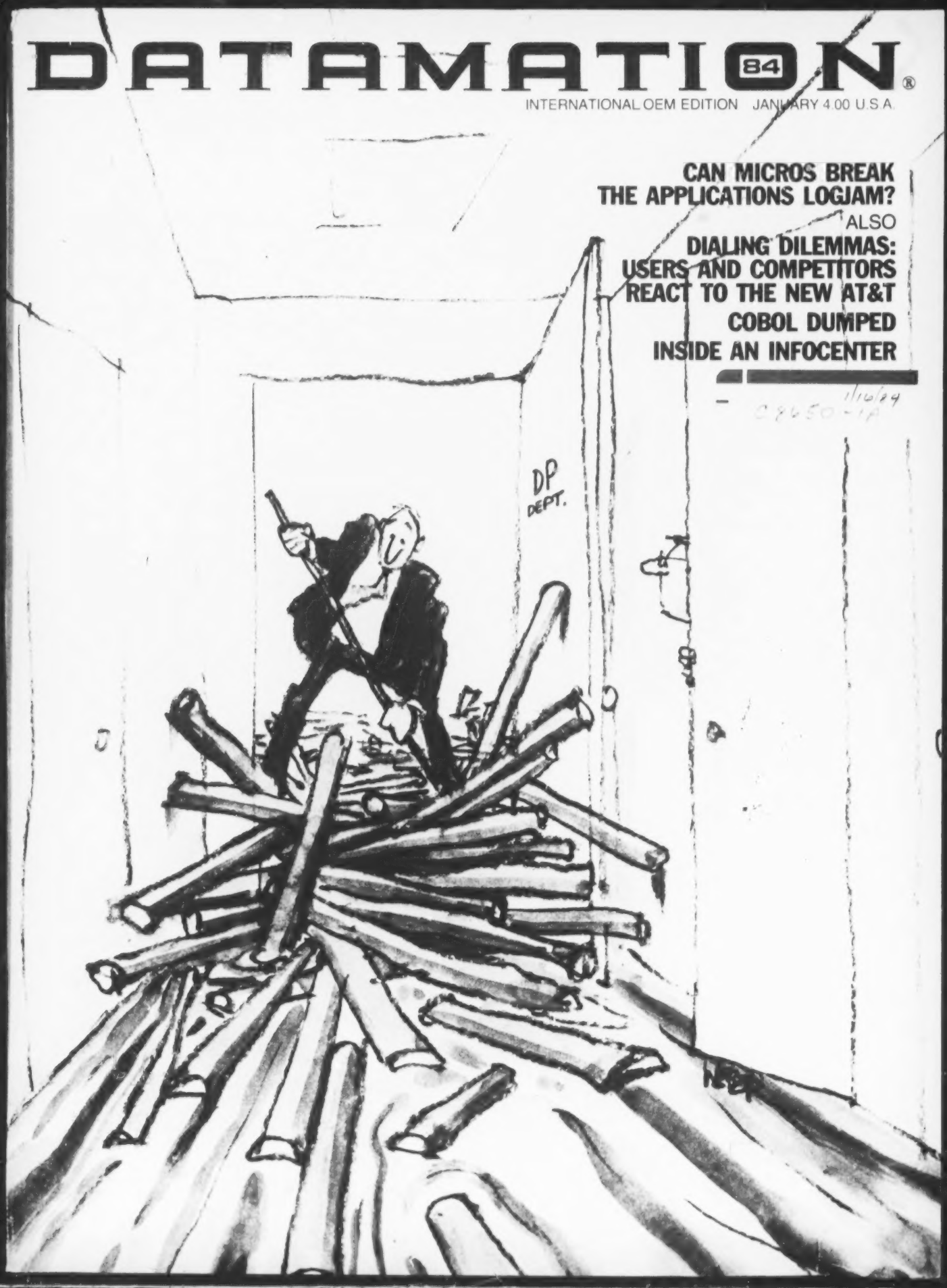
CAN MICROS BREAK THE APPLICATIONS LOGJAM?

ALSO

DIALING DILEMMAS: USERS AND COMPETITORS REACT TO THE NEW AT&T

COBOL DUMPED

INSIDE AN INFOCENTER



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COVER ILLUSTRATION BY BOB WEBER

The world is shrinking, not from geology, but technology.

GOING GLOBAL WITH WORLDWIDE NETWORKS

by Paul Tate

In case you hadn't noticed, the world is getting smaller. You won't feel the earth shrinking under your feet, because the change is due to technology, not geology. This global contraction is a result of developments in international communications techniques that render established conceptions of distance obsolete.

This latter-day continental drift is accelerating as global telecommunications and information networks become more sophisticated and widespread. Advances in digital transmission and switching technologies allow these networks to be used more readily for transmission of data, text, and images.

At the same time, increased use of communications satellites and high-capacity terrestrial and undersea cables are making international networking more viable. Worldwide networks are already vital life-lines for organizations involved in international finance, transportation, and commerce. And, as the networks expand so does the number of users.

Going global is not such a big deal anymore. International communications links are sufficiently extensive, in the developed world at least, to allow manufacturing and assembly to be done where it is most economical. They are also reliable enough to permit corporate information to be stored where it is most convenient. Thus, overall control of the operation is as effective across continents as it is across an office corridor.

What we are talking about here is an expansion of world trade, in which global communications networks play an increasingly important role. "World trade and telecommunications have developed along similar lines," contends Siemens president Karlheinz Kaske. "In 1980 the flow of goods and information in world trade accounted for 23% of global GNP. This is expected to rise to 30% by 1990, and the expansion will be made possible by the simultaneous availability of information thousands of kilometers apart—thanks to the telephone, text, and data communications. International telephone traffic alone is increasing at an annual rate of 15%, and the growth in text and data traffic is at least as fast."

But not as fast as the predictions in the '70s suggested, according to David Lawrence, general manager of business development at Cable & Wireless in the U.K. "The pundits said that data would outstrip voice communications by the mid '80s, but it is nothing like that. The growth of international data communications has fallen far short of expectations."

Lawrence admits that there have been significant increases in the volume of data traffic for applications like database access, particularly to the U.S. When it comes to bulk data transmission, however, "it is still cheaper to put a mag tape on a plane than to pay for a 2Mb link," he explains.

GLOBAL NETWORK PROBLEM

Cost is only one of the thorns in the side of a budding multinational. Despite the considerable advances already made in international networking, global nets still face global problems. Current trends in worldwide communications systems are, in fact, aimed at overcoming the remaining technological, economic, and political obstacles.

From a technological point of view, these networks will provide greater global coverage, offering increased communications capacity to meet the rising demands of international organizations and enhanced ease of use. This user friendliness will evolve as the various national systems become more compatible to each other.

First problem: the only two communications networks that come anywhere near being global are the telephone and telex nets. Even these, however, do not cover the world with any degree of uniformity. For example, 90% of the world's 550 million telephones are installed in 15% of the countries—an imbalance that reflects economic concentration. While these networks carry data and text, they are not really designed to support the wide range of information-based services now being demanded by businesses.

In addition to the basic telephone network, there are numerous specialized data networks that have emerged, mostly in the developed nations. First there are the circuit-switched networks like Datex-L in Germany and the Nordic Public Data Network. Then there are the packet-switched networks like Transpac in France, Packet Switchstream in the U.K., and the pan-European Euronet network. The circuit- and packet-switched systems, which offer international gateways to users, have carried much of the recent global data traffic. As the PTTs increase the number of gateways to foreign networks, this traffic is expected to increase.

Yet, there is still a considerable amount of incompatibility among these specialized systems and the way in which they are implemented in various countries. In packet switching, for example, the national PTTs have implemented so many different options under the X.25 umbrella that another, more rigid standard, X.75, had to be introduced. This standard for international packet-switching gateways allows the various national systems to talk to each other.

Hans Baur, head of Siemens' public communications division, complains that "practically no globally open networks using packet switching and circuit switching have yet evolved." And that's mainly because the demand simply hasn't been there. It will be soon though, according to Baur, who predicts "a worldwide spread of data networks within the next few years."

The PTTs' creation of incompatible data networks has been the subject of much debate in the European Commission. Last September a Commission report severely criticized the PTTs' go-it-alone policy. It went on to recommend that European telecom-

munications networks be harmonized before the various implementations become too entrenched. The report calls for expedited agreement on interface standards on the European networks and for the joint development of more international communications links by the PTTs.

Many PTTs are planning on updating their analog-based phone networks. This transition into the digital domain should help the harmonization effort, as long as common standards are adopted, that is. The switch to digital, however, will take a long time, since the PTTs have an enormous investment in existing plant. Replacing them will stretch their capital resources to the limit.

"The past is still with us, especially in countries endowed with large plant and installations," notes Jacques Darmon, manager of Thomson-CSF's communication arm. (The worldwide investment in telephone plant is estimated to be around $500 billion.) Darmon foresees the difficulties that many countries will face in upgrading their telecom equipment: "The present system simply can't be abolished. Telecommunications systems cannot be replaced like automobiles."

The development of digital switching systems is not only causing widespread changes in national telephone networks, but it is also trimming down the number of suppliers of public switches. Over the last 18 months the following developments in Europe served to highlight this supplier trend: in the Netherlands, Philips ditched plans to develop its PRX-D switch and began looking for ways to fill the gap with the AT&T ESS system; in France, Thomson-CSF and CGE announced plans to merge their operations; in the U.K., Standard Telephones & Cable left the System X development team; in Switzerland, the PTT has abandoned the idea of developing its own digital public switch with Siemens and Hasler; and in Italy, Italtel has signed a joint venture agreement with GTE.

Two main reasons motivated most of these moves—a shortage of technical expertise and the high cost of development. LM Ericsson, for example, has spent $500 million to date on developing its Axe digital public switch. The market is there, however, and as the PTTs continue to introduce digital systems the remaining suppliers should be able to make a healthy return on their investment over the next decade.

NATIONAL DIGITAL NETWORKS

The national digital networks being put together by the PTTs will allow end users to tap into a whole new range of datacom services. These future nets will integrate voice and data on the same line and make access to the network simple for all forms of communications. That, in

A NEW ORBIT FOR SATELLITES

Ever since Early Bird bleeped its way to world fame in the '60s, the communications satellite business has been going up and up.

Traditionally supporting telephone, tv broadcasting, and some data transmission, communications satellites are now orbiting into a new service realm. Launching them into that realm are recent advances in digital communications and space technology, which allow a whole new range of business-oriented services to be offered. These down-to-earth services include high-speed data transmission, electronic mail, facsimile links, and videoconferencing.

What's more, there will be a massive expansion in satellite capacity as numerous bigger birds rocket into space over the next five years. The number of international satellite circuits is expected to almost double from 36,000 in 1983 to around 66,000 by 1988.

That's a lot of capacity, perhaps too much for what is still a young and relatively unquantifiable market. Yet, it's clear that the demand for satellites that function as international gateways and adjuncts to national communications networks is growing rapidly.

The worldwide interest in satellite communications is reflected by the popularity of the international satellite body Intelsat, which now has 109 member nations. (Intelsat also leases satellite capacity to 40 other countries.) This year Intelsat plans to offer a business communications service, which will enable organizations to establish their own international networks for voice and data. It is also switching to digital transmission technology. In fact, the Intelsat V-A satellite scheduled for takeoff this year and the future Intelsat VI will both use time division multiple access (TDMA) digital modulation techniques.

Over the next few years, Europe plans to launch a whole squadron of satellites. The European satellite organization Eutelsat, which launched its first bird, the Orbital Test Satellite OTS, in 1978, put its second satellite into orbit last year. Called the European Communications Satellite, ECS-1, it will offer the European PTTs pan-European services for telephony and tv broadcasting, and data transmission to large dish aerials. The ECS-2, the second satellite in the ECS series, will go up this year. It will provide a new business service called Satellite Multi-Service (SMS), which offers 64Kbps to 2Mbps rates for data, test, voice, and image. The service will be accessible via small dish aerials measuring 5 meters to 7 meters. A larger capacity satellite, L-Sat, which will also support SMS, is currently under development.

While Eutelsat seems eager to get its business service under way, it was in fact the French who prompted the addition of SMS to the ECS plans. France intends to send off its own satellite, Telecom 1, at the beginning of this year. Telecom 1 has been specifically designed to offer information-based services. The commercial services, which will use five transponders, will be accessible from 3.5-meter dishes. France is leasing some of the satellite's capacity to other PTTs such as the German Bundespost. The ECS SMS service will also use part of Telecom 1's capacity.

The French have decided to offer basic data transmission on leased lines to users. The basic subscriber services, which are also available to closed user groups, include low-speed (2.4Kbps), medium-speed (64Kbps), and high-speed (2Mbps) data transmission rates.

The U.K. PTT, British Telecom, is also planning to launch its own satellite, Unisat, which will leave the launch pad in 1986. It will also support an SMS-type service known as SatStream. In the meantime, it will offer SatStream service in Europe via the ECS-2 and Telecom satellites, and in North America via Intelsat and various carrier agreements.

West Germany is also developing a national satellite called DFS, which will be in outer space by 1987. In the same year, Sweden, which has gone its own way following the postponement of the Scandinavian Nordsat satellite launch, plans to put its Tele-X bird into orbit. Italy will also test its wings with the Italsat satellite in 1986, but full operation isn't expected until 1990. Each of these national satellites will support SMS-type business services.

Other nations throughout the world have also entered the satellite race. The Arab nations have teamed up to develop their own satellite Arabsat. The first version, offering a range of commercial services, is scheduled to go up this year.

Japan orbited its first communications satellite, the CS-2a, last January. This put the nation nine years behind Canada, which was the first country in the world to launch a communications satellite. The CS-2a, also known as Sakura-2a, will provide datacom, high-speed fax, and video conferencing services to Japanese businesses. The next satellite, the CS-3, is scheduled to be sent aloft during fiscal 1987.

Thousands of miles south of Japan, Australia is also getting up to speed in the satellite race. AUSSAT, the country's hotly debated state-owned satellite company, expects to send off two birds by July or August of 1985. A third satellite is slated to be launched about two years later. Australian businesses will be able to use the satellites for some telecom traffic, including data transfer.

Don't let all this activity fool you, however. Right now the market for satellite communications is still limited. While more capacity and a wider variety of services may encourage usage, the size of future demand is still very much up in the air. —P.T.

fact, is what the Integrated Services Digital Networks (ISDN) is all about. And it is hoped that the adoption of international standards for ISDN will help increase the compatibility among the various types of networks now in existence. At least it will make accessing the different networks easier. The plan is to have circuit-switched, packet-switched, and non-switched networks all accessible through a local ISDN exchange. Eventually even the different networks themselves will be integrated, or so the theory goes.

"As a result of international cooperation and standards, ISDNs will be able to offer universal interfaces and service features for worldwide communications," according to AT&T's Irwin Dorros.

Dorros is nevertheless realistic about how the theory will be put into practice: "It does not mean that all the ISDN aspects will be the same from one region or country to the next, or even among competing carriers in the same country. However, the basic methods for accessing and utilizing ISDNs should be the same worldwide."

While certainly a step in the right direction, the ISDN concept will still take many years to implement. Even in the more advanced countries, ISDN probably won't become a reality before the 1990s.

In the meantime, companies will have to find ways of dealing with the public network problems. Many companies have found the solution in-house. "More and more customers are doing their own thing," points out Cable & Wireless's Lawrence. "They are setting up their own corporate networks, which cuts costs, gives them more control, more security over the information being transmitted, and better use of their existing equipment."

Private networks are already a well-established method of international communications in many areas of world trade, travel, shipping, and finance. For example, the SWIFT (Society for Worldwide Interbank Financial Telecommunications) international banking network, which handles much of the payments information among 1,104 banks in 52 countries, has been in operation since 1976. SWIFT's U.K. manager Barry York believes SWIFT has helped transform international banking by fostering cooperation and standardizing payment mechanisms. "The very existence of SWIFT has made it easier for banks to automate their international operations," he maintains.

To set up a network such as SWIFT or any other global system for that matter, you need to have the right links in the right places. This is where satellites can be a big boon to international communications systems. "The major characteristic of satellite communications systems," explains Nippon Electric chairman Koji Kabayashi, "is its ability to offer high-quality wideband transmission to a vast area regardless of surface distances or natural obstacles. That makes it possible to construct a global communications network quickly and economically."

FIG. 1

INTERNATIONAL CABLE CAPACITY*

Europe—North America	11,000
Europe—South America	3,000
Europe—South Africa	360
North America—Australia/NZ	1,500
India—Malaysia	500
Malaysia—Japan	2,000
Japan—North America	1,000
Southern Europe—Eastern Mediterranean	2,000

*In channels
Source: U.K. Department of Trade and Industry.

The satellite population is expected to skyrocket over the next few years, doubling the current number of international communications circuits and providing a whole new range of transmission services for commercial voice and data applications (see box).

Terrestrial and undersea cable capacity is also increasing. The Sea-Me-We Venture, one of the most ambitious undersea cable projects, will provide 1,200 circuits from Southeast Asia to the Middle East and 2,400 circuits from there to Europe.

EXPANDED CABLE CAPACITY

Fiber optic techniques have also expanded cable capacity. One hair-thin strand of glass in a fiber optic cable can handle 100,000 phone calls simultaneously. Fiber optic cables are now being planned for use in international links. The first underocean cable will be laid between Europe and North America in 1987.

Wiring the world can prove beneficial to developing nations as well. By getting access to some of the information on these networks, developing countries can play a bigger role on the international trade scene—a role that will enable them to boost their own economies.

While the technical constraints are slowly being dealt with, there are other, more ominous obstacles that must still be overcome in setting up those new global trade routes. Those obstacles come in the form of policies—national transborder dataflow (TDF) policies that could have serious implications for countries and companies using worldwide data transmission systems.

More and more countries are cracking down on the flow of information across their borders. If the restrictions on dataflow become too severe, the whole question of international networks becomes moot. One person who sees the danger is Cable & Wireless's Lawrence, who warns, "The new trade routes in information must be kept as open and free as the seas used to be." ❋

CARTOON BY JAN VAN WESSUM